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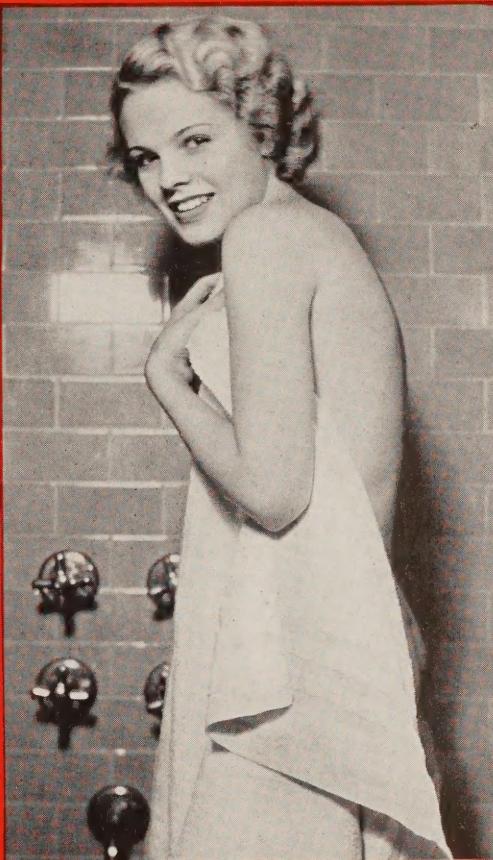
Purchasing Agent
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TRIPLE DUTY SYSTEM

OF *Warm Water* HEATING

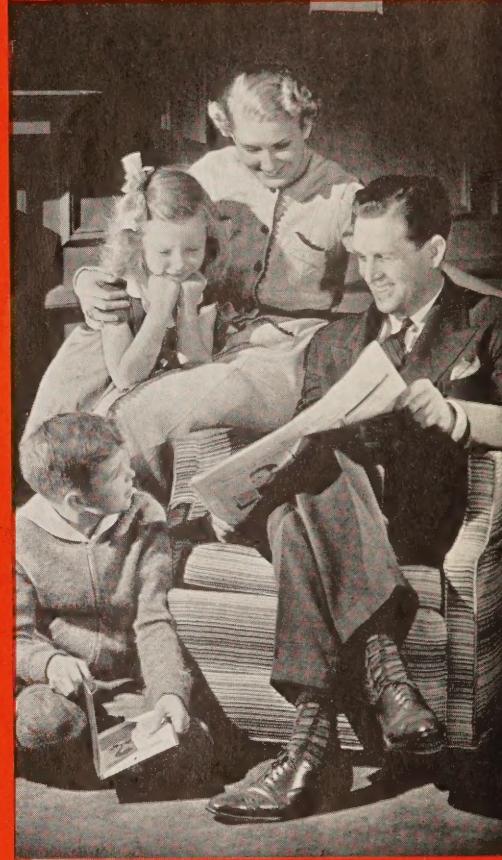


Early morning warmth



Year around domestic hot water

Bulletin T-1137



Uniform temperature—Fall to Spring

Heat and Hot Water for less
than the usual cost of heat alone



BELL & GOSSETT COMPANY

3000 WALLACE ST., CHICAGO

B & G TRIPLE DUTY SYSTEM



A WARM WATER HEATING SYSTEM WHICH EXPANDS OR CONTRACTS TO MATCH THE WEATHER

If you could automatically make the radiation in a home larger or smaller to meet changes in outdoor temperature, then you would have a true modulation of the heat supply. Today, you *can* do it, in effect, with B & G Triple Duty heating. The illustration above is an accurate representation of the modulating power of this modern, forced-circulation heating system.

This sensitive control is most important—because heretofore the greatest cause of discomfort and fuel waste has been inability to prevent over-heating.

The B & G Triple Duty System is essentially a *warm water* heating system, normally supplying mild heat which does not bake the moisture from the air. Yet, during severely cold weather, it will deliver water sufficiently hot to satisfy the maximum heat requirements for which the system was designed.

Between the old-fashioned gravity-feed hot water system and the Triple Duty forced-circulation system, the only point of resemblance is that water is used as the heating medium. Today, heating the house with water offers advantages found in no other type of system. Among them are rapid heat, accurately modulated heat, year around domestic hot water supply and an economy of operation nearly incredible when compared with previous cost standards.

ADAPTABLE TO ANY HOT WATER BOILER AND TO ANY BTU EMISSION DESIRED

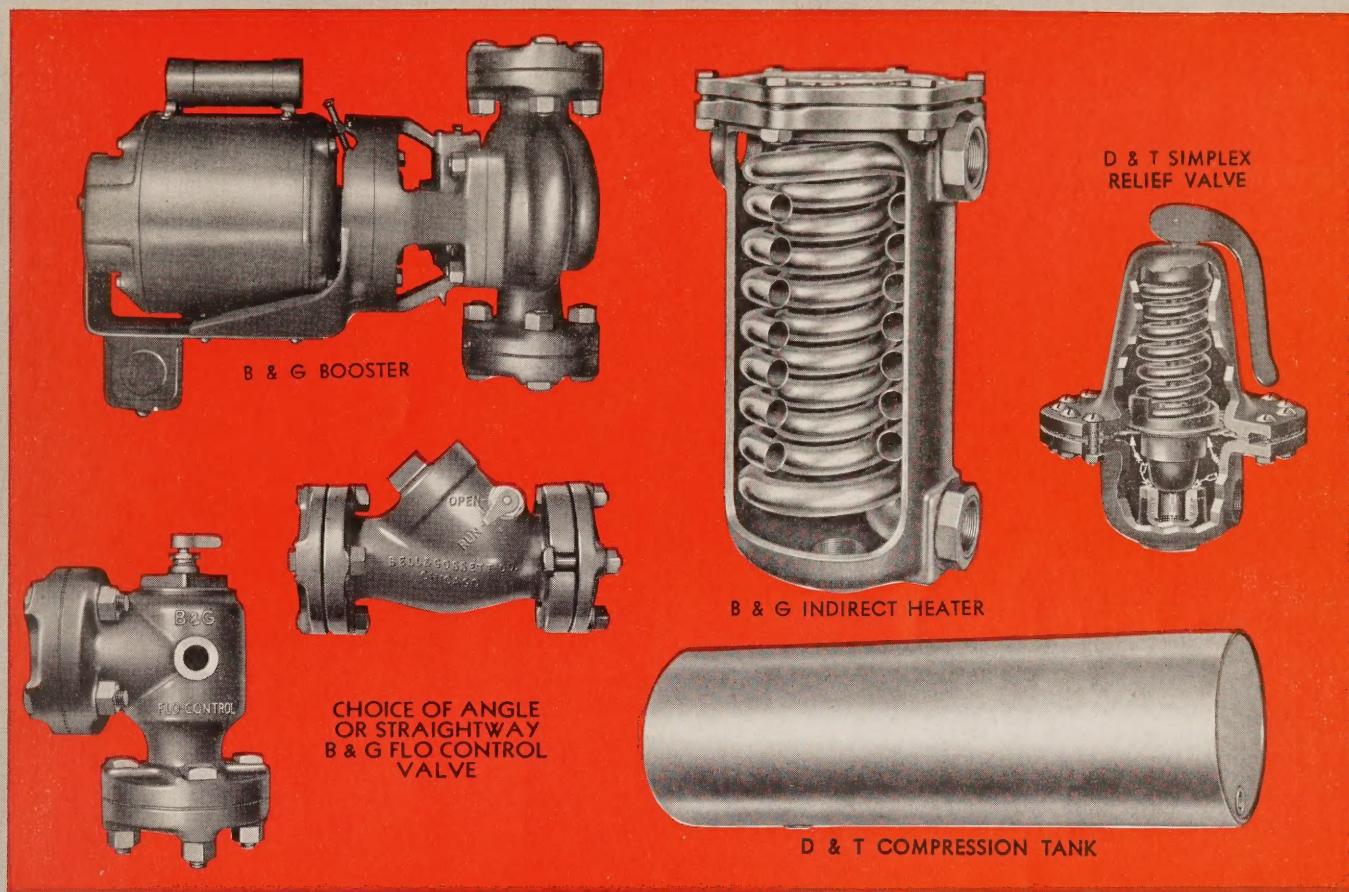
Old, gravity-feed hot water heating systems can be brought up to date by installing the few simple units of B & G Triple Duty equipment. No change in the piping or radiation is required. On new installations, however, the present practice is to design for a 200 BTU per sq. ft. emission, so as to permit the use of radiators only 20% larger than required for steam. Because of forced circulation, the piping also can be materially reduced in size.

The controls of a B & G Triple Duty System are adaptable to any form of firing, whether oil, stoker or manual, and are entirely automatic in operation.

Briefly, each unit in the system performs the following duties:—

B & G BOOSTER This is a circulating pump which forces water to the radiators at a much faster rate than is possible with ordinary gravity flow. The Booster is controlled by a room thermostat and runs only when heat is required. Forced circulation obviously means that quick heat is supplied when needed—in the morning, for example. In conjunction

B & G TRIPLE DUTY SYSTEM



with a B & G Flo-Control Valve, the Booster also provides an accurate control of heat supply to the radiators.

The B & G Booster is a product with years of constant improvement reflected in its quiet, powerful and dependable performance. For complete data see B & G Booster Bulletin.

B & G FLO-CONTROL VALVE

This valve controls the flow of boiler water through the main. It stays tightly closed except when the Booster is running, at which time it is forced open by the rush of water through the pipes. When the Booster stops, the hinged Flo-Control Valve closes of its own weight and prevents gravity circulation of hot water to the radiators. This is one reason why over-heating does not occur in the Triple Duty heated home.

B & G INDIRECT DOMESTIC WATER HEATER

The Indirect Heater is the unit which plays a major part in producing the amazing economies of a B & G Triple Duty System. It furnishes domestic hot water—winter and summer—at as much as 75% under the cost of a separately fired heater.

Domestic water flows through the copper tubing of the heater where it is heated by the boiler water circulating through the jacket of the heater. In summer, boiler water is kept just hot enough to heat the domestic

water. The radiators, however, remain absolutely cold, because the Flo-Control Valve (which does not open except when heat is needed) prevents circulation of the boiler water.

On an automatically fired system just a few operating periods daily will keep ample supply of hot water on hand. Hand-fired systems can be operated on rubbish plus just a little fuel.

B & G Indirect heaters are available as external or built-in storage tank types or as external tankless heaters.

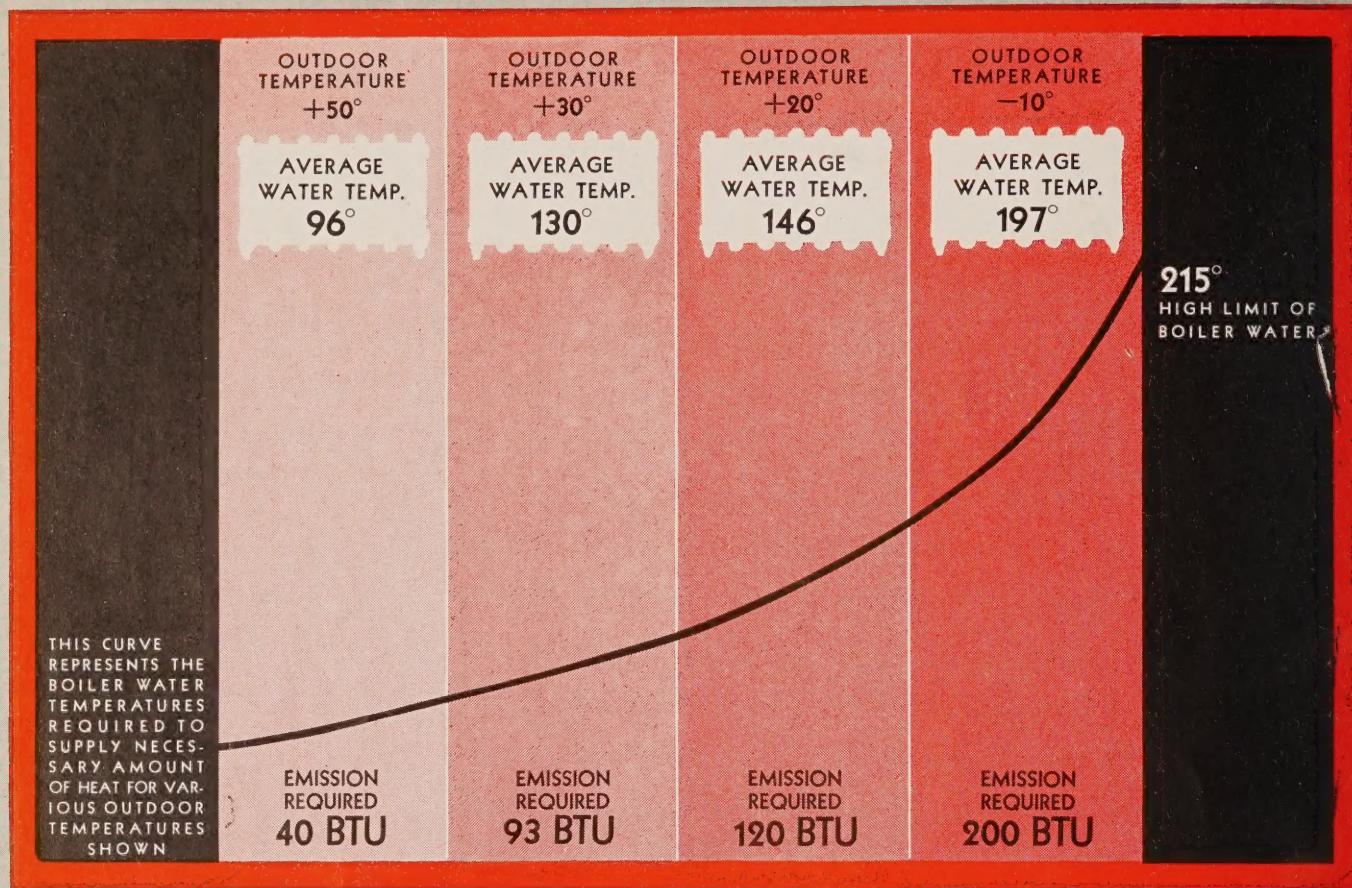
B & G THERMOCHEK

When the system is designed for an emission of 200 BTU or over, it is advisable to install a B & G Thermocheck in the return between Indirect Heater and boiler. This patented device automatically controls the temperature of the storage tank water, preventing the over-heating which causes liming of the heater coils and service water piping.

D & T PRESSURE SYSTEM

B & G Triple Duty Systems operating at heat emissions higher than 150-160 BTU must be installed as closed systems, so that sufficient pressure can be built up to prevent boiling. For this purpose a D & T Compression Tank and Relief Valve are installed. This is the original D & T "Tank-in-Basement" System—fully described on page 8.

B & G TRIPLE DUTY SYSTEM



HEAT CONTROL AS SENSITIVE AS A CAT'S WHISKER . . .

How smoothly a B & G Triple Duty System adjusts the heat supply to the weather is clearly illustrated in the above diagram.

Let us assume that we have a Triple Duty System designed to provide a heat emission of 200 BTU per sq. ft. of radiation. Its electrical controls consist of two aquastats in the boiler, a relay and a room thermostat.

When the thermostat calls for heat, the Booster pump and burner start *simultaneously*. The Booster circulates water to the radiators until the thermostat is satisfied, at which time both Booster and burner stop. When the operating period is long, as in severely cold weather, the High Limit aquastat cuts-out the burner when boiler water temperature reaches 215°, but permits the Booster to continue operation.

Now let us see what happens in the System when outdoor temperature is 50° above zero. As shown in the left hand panel above, an average water temperature in the radiators of only 96° will provide a BTU emission sufficient to keep the rooms at 70°.

Suppose that because of the infrequent demands of the thermostat in mild weather, the boiler water temperature has dropped to about 150 degrees. When the thermostat

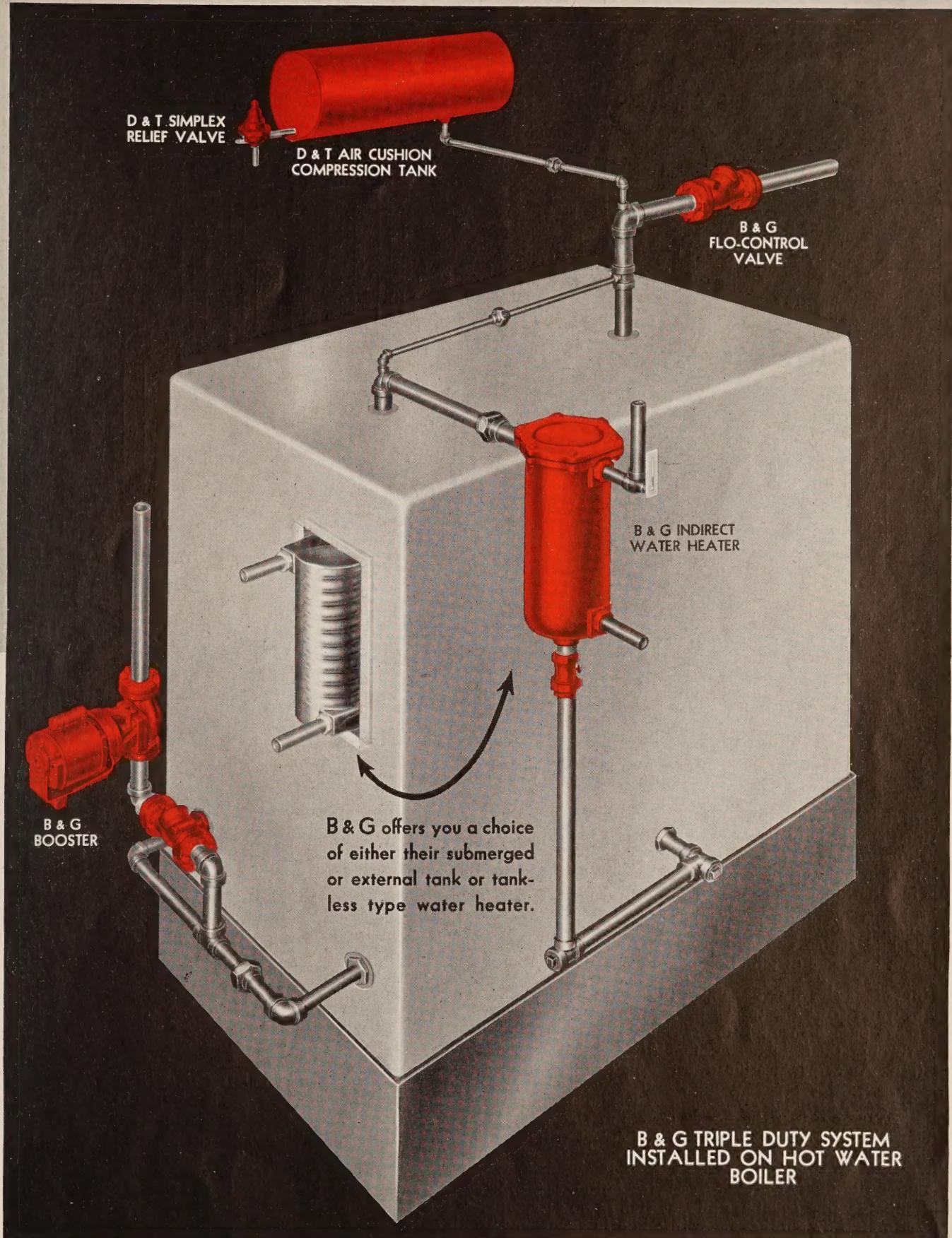
calls for heat, the Booster starts circulating this low temperature water. Since the system itself is filled with water of even lower temperature, the average of the two is a very mild degree of heat. It is hot enough, however, to quickly supply the low BTU requirement of the radiators on a 50° day. The Booster, therefore, cuts-out before the water throughout the system reaches a high degree.

On days of maximum cold, the operating periods of the Booster and burner are longer, permitting the average temperature in the radiators to be built up to satisfy the heavier heat demand. All intermediate heat requirements are similarly handled in a smooth cycle of operation which eliminates both under and overheating.

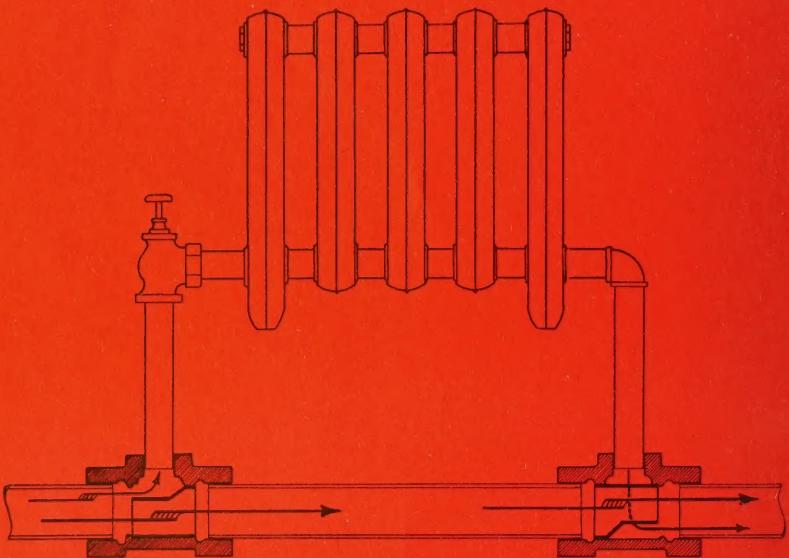
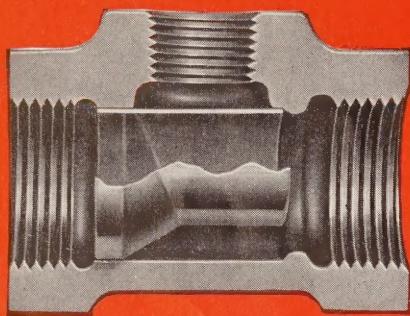
SUMMER-WINTER DOMESTIC HOT WATER HOOK-UP

A second aquastat in the boiler functions to keep boiler water hot enough to heat domestic water—in summer as well as winter. It is wired in parallel with the High Limit aquastat and starts the burner when boiler water temperature drops below 150°. Unless the thermostat is calling for heat, this second aquastat also cuts-out the burner when boiler temperature reaches 170°.

B & G TRIPLE DUTY SYSTEM



B & G TRIPLE DUTY SYSTEM



HOW MONOFLO FITTINGS OPERATE

B & G MONOFLO FITTING REVOLUTIONIZES HEATING PRACTICE—MAKES A SINGLE MAIN DO THE WORK OF TWO

One of the greatest economy features of a B & G Triple Duty System is the fact that it can be installed with a single pipe acting as both supply and return main. The B & G Monoflo Fitting, when used in conjunction with Triple Duty equipment, eliminates the need for the more expensive two-pipe installation.

The Monoflo Fitting is installed in place of the usual tee at each radiator's supply and return connections to the main. In operation, it assures a uniform, balanced distribution of water to every radiator.

An ingenious sleeve arrangement in the Supply Monoflo diverts a portion of hot water from the top of the main into the radiator riser. After the water has passed through the radiator it is returned to the bottom of the main through the Return Monoflo Fitting, which has the sleeve in a reverse position. An actual stratification is thus maintained in a single pipe.

The B & G Triple Duty Monoflo System permits the installation of radiators at or below the boiler level and circulates them effectively. A special down-fed Monoflo, however, is used where radiators are below the main.

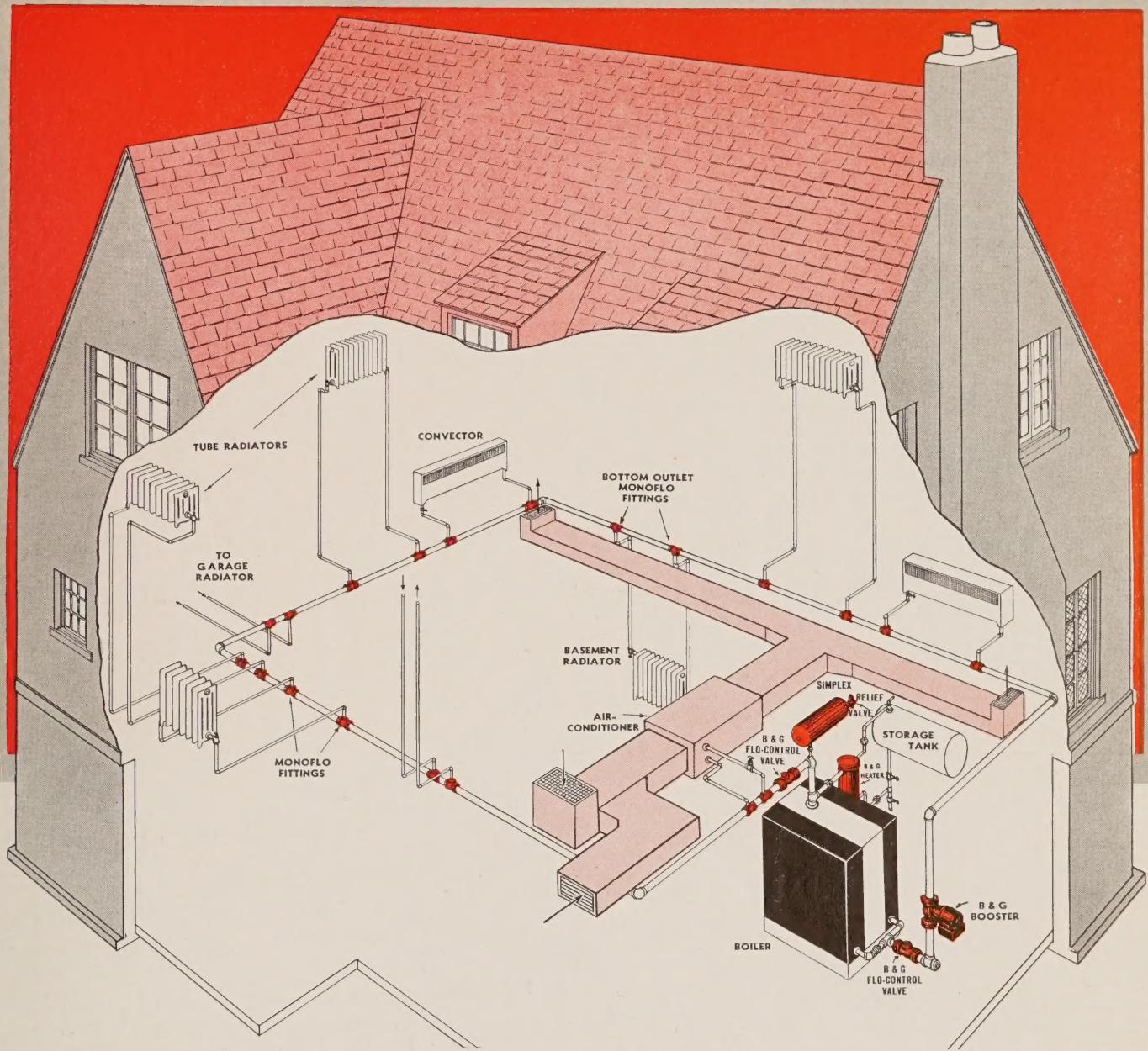
The utter simplicity of this forced-circulation, one-pipe system results in substantial savings in labor and material. In no case, where a B & G Triple Duty Monoflo System has been installed in accordance with our instructions, has it failed to give completely satisfactory, economical operation.



MODERN WARM WATER HEATING DESIGN SIMPLIFIED!

Full directions for designing and installing either one or two-pipe B & G Triple Duty Systems are given in this simplified, understandable booklet. All design methods are based on practices approved by the American Society of Heating and Ventilating Engineers. Given free upon request.

B & G TRIPLE DUTY SYSTEM



COULD ANYTHING BE SIMPLER THAN THIS TRIPLE DUTY MONOFLO SYSTEM . . . WITH AIR CONDITIONING INCLUDED

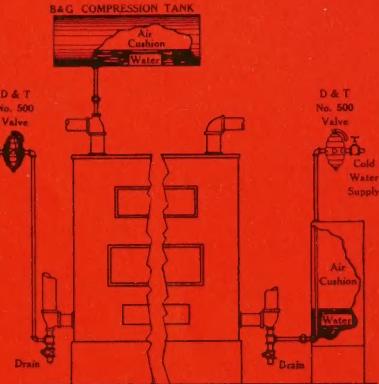
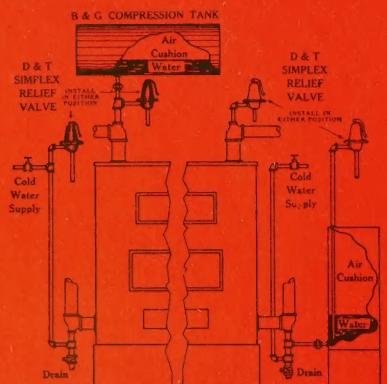
Economy of material and labor is written all over this typical installation of a B & G Triple Duty Monoflo System. Both the designing and installation are so simplified that observance of a few clearly defined rules will guarantee a system of unparalleled comfort and economy.

Air conditioning has been provided with an auxiliary unit, which is operated independently of the heating plant. This independent control is important, because it removes the limitations imposed on air conditioning equipment which is operated in conjunction with the heating system. In other words, cutting down the heat supply does not similarly restrict the air conditioning. Regardless of the amount of heat being delivered, the

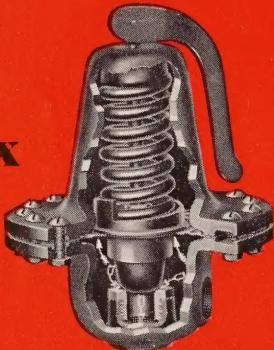
air conditioner continues to provide its full quota of refreshed air.

It is apparent, too, that only a small amount of easily installed duct work is required to circulate an abundance of pure, clean air throughout the house. In this connection, note that a B & G Triple Duty System has less need for the humidifying function of an air conditioner than systems which employ a different type of heating medium. Excessive dryness in the home is caused by supplying heat at high temperatures, which literally bakes the moisture from the air. The B & G Triple Duty System, by its sensitive control of water temperatures and circulation, furnishes heat so accurately modulated that overheating does not occur.

B & G TRIPLE DUTY SYSTEM



**D & T SIMPLEX
PRESSURE
SYSTEM**



**D & T No. 500
SELF FILLING
PRESSURE
SYSTEM**



WHY CERTIFIED HEATING ASSOCIATIONS DEMAND THE USE OF A COMPRESSION TANK ON CLOSED JOBS

The D & T Pressure System, consisting of Compression Tank and Relief Valve, performs three important functions in a B & G Triple Duty System. First it provides the pressure necessary to prevent boiling in systems operating on heat emissions higher than 150-160 BTU. Second, it provides an air cushion against the expansion of heated water in the system, protecting the boiler. Thirdly, it prevents the need for frequent make-up water.

When the water in the system is heated, it expands. If no tank is installed, the expanding water is forced through the Relief Valve onto the basement floor. When the system cools, additional cold water must be drawn in and extra fuel consumed to heat it. With the number of expansion and contraction periods which occur daily in a hot water system, this extra fuel can easily total up to an appreciable sum during a heating season.

Likewise, over a period of years, the continual adding of water causes liming of the boiler with resultant increase in fuel consumption.

When a D & T Compression Tank is used, the expanding water is forced up into it, compressing the air in the tank. As the system cools, water is forced back into the boiler by this built-up air pressure. Hence, make-up water is seldom necessary and lime deposits in the boiler prevented.

The cushioning effect of the compressed air in the tank relieves the pressure on the boiler and prevents damages that might otherwise occur from over-heating.

As shown above, D & T Pressure Systems are available in two types—the Simplex and Self-filling. In each type the tank can be installed either on the floor or the ceiling. For complete description see D & T Pressure System Bulletin.

BELL & GOSSETT COMPANY
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